Preparing for a Sanitary Survey

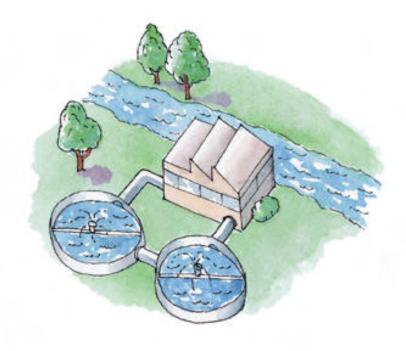
Information to Help Small Water Systems

This booklet is intended to be used by the owners and operators of small public water systems.

January 2006







This booklet is based on Washington State's Department of Health booklet of the same title. We thank Washington State for their permission to adapt and reprint this information for Massachusetts's public water systems.

This document is available in alternate formats. Call the ADA Coordinator at 617-556-1057. TDD Service 1-800-298-2207 This and other publications are available at http://www.mass.gov/dep/water/index.htm

Table of Contents

Introduction	1
Sanitary Survey Inspection Process	2
Regulatory requirement	
What is a routine sanitary survey?	2
Notification and inspection	2
Fees	2
Next steps	3
Potential enforcement actions	3
Minimum Components of a Routine Sanit	ary 4
Discussion and review of records	
Inspection of water system	6
Safe inspections	8
Self-Inspection Checklist	9
Common Deficiencies Surveyors Hope No	
Inspections reveal poor housekeeping	
Water System Operations	15
Reliability	15
Operations and maintenance manual	15
Operations and maintenance schedule	18
Seasonal water systems	19
Cross connection control	20
Record keeping and reporting	21
Continuity of service	23

Water System Approval Process	24
System approval status	24
Approval process	24
Construction documentation	24
Terminology	26
Public water system	26
Human consumption	26
Water system classification	26
Classification flow chart	27
Annual Certificate of Registration	28
MassDEP Regional Contacts	28

MassDEP web pages referred to in this booklet:

Guidance, Policies, and Regulations http://www.mass.gov/dep/water/lawsrule.htm

Operator Certification

http://mass.gov/dep/water/compliance/certop.htm http://www.mass.gov/dep/water/approvals/dwsforms.htm#opcert

Cross Connections

http://mass.gov/dep/water/crosscon.htm http://www.mass.gov/dep/water/approvals/dwsforms.htm#crosscon

Sanitary Survey TBA

Capacity Development

Seasonal TNC Systems http://mass.gov/dep/water/compliance/tnc.htm

Introduction

A safe and reliable drinking water supply is of fundamental importance to our health and well-being. Through proper operation and maintenance of your water system, you assure that safe and reliable drinking water is served to the public.



The purpose of this booklet is to help you prepare for a routine sanitary survey of your water system. While this guidance covers a broad range of topics, it is not an in-depth technical manual. It will, however, address the fundamental concepts of a routine sanitary survey and provide basic information to help you prepare for a survey.

The booklet includes the following:

- Sanitary survey inspection process;
- Minimum components of a routine sanitary survey;
- ♦ Self-inspection checklist;
- Common deficiencies surveyors hope NOT to find; and
- Information to help you operate and maintain your water system.

The components of a routine sanitary survey discussed in this guide mirrors the eight major elements required in a survey of a water system. Each section summarizes the information that can be found in the regulations, policies, or guidelines. Users of this booklet should consult the Massachusetts Drinking



Water Regulations 310 CMR 22.00 and the Massachusetts Guidelines and Policies for Public Drinking Water Systems for additional information (http://www.mass.gov/dep/water/lawsrule.htm).

Sanitary Survey Inspection Process

Regulatory requirement

The federal Safe Drinking Water Act (SDWA), calls for a routine sanitary survey of all public drinking water systems once every five (5) years, except for community surface water systems, which are to be surveyed once every three (3) years.

What is a routine sanitary survey?

A routine sanitary survey is a periodic inspection of a water system's facilities, operations, and record keeping. The inspections identify conditions that may present a sanitary or public health risk.

Notification and inspection How will I be notified?

You will receive a notice from MassDEP staff when a sanitary survey is required. The surveyor will then contact you to make

arrangements for conducting the survey. They will work cooperatively with you to meet individual scheduling needs if possible. MassDEP may conduct unannounced or limited notice inspections.

Who will conduct the survey?

Sanitary surveys are conducted either by MassDEP staff or by a MassDEP designee. Designees may include local health officials or independent contractors.

Fees

There is no specific charge for the MassDEP to conduct a sanitary survey of your facility. However, all public water systems pay an annual assessment fee to the Commonwealth of Massachusetts for Safe Drinking Water regulatory oversight.



Next steps

What happens after the survey is completed?

After the survey is done, the surveyor will discuss with you any observed deficiencies. A completed survey checklist and a summary report with findings will be provided to you or mailed to you. Please read the report carefully, as it describes any observed deficiencies found during the inspection. It is your responsibility to correct these deficiencies promptly. MassDEP will notify you in writing if any immediate follow-up action is required.

Potential enforcement actions

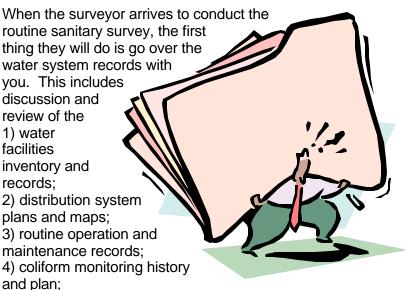
What happens if I do not follow the requirements?

The primary reason for following the requirements is to insure that the water you serve people is safe to drink. Failing to meet your legal responsibilities to correct deficiencies promptly may result in any or all of the following:

- Issuance of an enforcement notice or order
- Increased monitoring
- Designation as a significant non-complier (SNC)
- Possibility of civil penalties
- The denial of other licenses or permits such as restaurant permits or liquor licenses
- Lawsuits Water users may file lawsuits against the owner.
- Inadequate capacity rating This could result in the denial of loans by a lending institution for buying, refinancing, or remodeling of the facilities served by the system. This could also result in the denial of building permits. (See Guidelines-Chapter 11 http://www.mass.gov/dep/water/laws/policies.htm#dwguid)
- Referral to the US EPA for enforcement

Minimum Components of a Routine Sanitary Survey

Discussion and review of records



- 5) source and finished water quality monitoring plan, history, and waiver status;
- 6) additional components.

You can help prepare for the inspection by gathering, reviewing, and organizing these records to easily share them with the surveyor.

1. A review of the water facilities inventory and records is done to make sure all the information listed for your water system is correct. This includes information on primary contacts, population served, number of connections, and storage capacity. The surveyor will note the changes directly on the form and return it to MassDEP to update the computer records. An accurate water facilities inventory and record is critical to properly classify a water system and to provide MassDEP with emergency contact information.

- 2. The surveyor will want to look at your distribution system plans and maps to see how often the maps are updated and if locations of the lines, valves, meters, tanks, sources, sampling sites, and treatment facility locations are accurate. Good things to have on a map are the size of the main line, the type of pipe installed, depth of bury, and even when the pipe was installed.
- 3. A review of your routine operation and maintenance records for the necessary practices that will ensure your system is capable of supplying safe and reliable water. Tips on how to develop an operations and maintenance manual and recommended maintenance schedules can be found in the Water System Operations chapter located in this booklet.
- 4. A review of your coliform monitoring history and plan and sampling procedures and latest results of any bacteriologic samples taken within the last two years.
- A review of your source and finished water quality monitoring history and waiver status sampling procedures and latest results of any samples taken within the last five years, including bacteriologic, lead/copper, inorganic, organic (VOC/SOC), radionuclide, trihalomethanes, and turbidity.
- 6. Depending on the complexity of the water system, the surveyor may ask about additional components, such as the status of other management, operation, and maintenance documents. These could include:
 - Water supply security measures;
 - Cross connection control program and test histories of any backflow prevention assemblies; and
 - Operator certification status.

If you have not developed water supply security measures or a cross connection control program, guidelines are available from MassDEP to assist you in developing your programs.

Additional discussion about these programs can be found in the Water System Operations chapter located in this booklet.

Inspection of water system

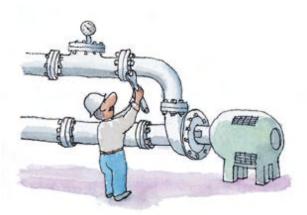
After the water system records have been discussed and reviewed, the survevor will then take a tour of the water system itself. The tour will include an inspection of the 1) drinking water source and



source protection area; 2) treatment equipment; 3) pumps, pumping facilities, and controls; 4) finished water storage; and 5) distribution system. Be sure to arrange for system personnel to be available on the survey date so they can show the surveyor around the system.

- 1. The surveyor will look at each drinking water source and source protection area, including emergency or seasonal sources, to see that they are properly secured and protected from possible sources of chemical or biological contamination. On the wellhead they will check for several items, such as: the well casing is 6-18 inches above the floor or pad: a sanitary seal (the seal between the wellhead and the pump); a source sampling tap; and an inverted screened vent. They will also look for any obvious holes into the wellhead for mice or bugs to crawl into and/or fall into the well and contaminate the water.
- 2. Next they will look at your treatment equipment, including chlorination. They will check that your equipment is working properly, check dosage rate calculations, and go over required chlorination

- reporting, including the daily residual readings and how they are taken and recorded.
- 3. They will look at pumps, pumping facilities, and controls to make sure they are in good working order and the facilities are clean.



- 4. Each finished water storage tank is looked at individually for structural soundness (interior and exterior damage and rust), access hatch lids are properly gasketed and secured, vents are adequately screened, the overflow and drain pipes are screened with a proper air gap, and area is properly secured. If these are not protected, birds, bats, insects, rainwater, and dust can enter and contaminate the stored water.
- 5. Finally, they will tour the distribution system to better understand the system layout, the pressure zones, elevations, and dead ends. They may request to check your cross connection records to see if the system is adequately protected from high health hazard facilities.

Safe inspections

What if the surveyor can't safely inspect your water system?

Situations arise in the field where the surveyor can't proceed with part or all of an inspection due to unsafe work conditions. They will let you know why they can't proceed and either point out what is needed before they can safely proceed or request that you get the information for them.

Unsafe to survey

If too many of the system's facilities are unavailable for inspection due to safety issues, the surveyor may decide that the system is not available to survey. In this case, the water system will receive written notice that it cannot be surveyed and will not receive credit for a survey. Sanctions may be imposed on systems refusing or not available for survey.

Things to remember to provide accessibility

- Have keys needed to open buildings, gates, well enclosures, hatches, etc.
- Special tools may be needed to open manholes or heavy lids.
- Clear brush or other vegetation around wells or buildings.
- Have available documentation of the last time elevated storage tank hatches, vents, and overflow screens and gaskets were checked, so the surveyor can verify there are no unprotected openings.



Self-Inspection Checklist

The checklist below may help you track important events and tasks during the process.

Date-start	Task/Event	Date-done
	System contacted and survey	
	scheduled	
	Arrangements made for system staff	
	to be available on day of survey	
	System records organized and	
	available	
	Final preparation for survey	
	completed	
	Survey conducted	
	Survey follow-up letter received and	
	filed	
	Needed corrections scheduled for	
	completion (if applicable)	
	Any additional follow-up	
	correspondence filed	



Common Deficiencies Surveyors Hope NOT to Find

Inspections reveal poor housekeeping

Sanitary surveys are a key component to protecting drinking water from contamination. Many deficiencies commonly found during a survey are often the result of poor housekeeping or maintenance. This possible route of contamination can be easily eliminated with simple improvements in housekeeping and maintenance practices. The following is a list of commonly found deficiencies surveyors hope not to find:

- Lack of a screened vent or other holes in the well casing.
- Lack of a screen or a damaged screen on storage tank vents.
- Storage tank overflows with out screens.
- Old piping and tanks not eliminated (not just "valved off").
- Did not use proper flushing and disinfection techniques after construction or repairs.
- Poor choice of water sampling tap.
- Poor control of sanitary control area around drinking water source.
- Deficiencies noted on a previous survey have not been corrected.
- Lack of a watertight cap on a well developed as a pitless adapter.
- Lack of a source water meter.
- Drinking and wastewater piping not clearly labeled.

On the next few pages are some photos of poor housekeeping habits or maintenance practices sanitary surveyors will be looking for when they visit your water system.



Opening in well casing and no screened vent



Well house used to store chemicals



Poorly maintained storage tank with ferns sprouting from top



Unsealed -storage hatch cover



Unscreened storage tank overflow



Poor housekeeping of the well house



Unscreened storage tank vent



Fill hose with no air gap, creating a cross connection hazard

Water System Operations

Reliability

What are my responsibilities for operating my system properly?

As the owner or operator of a public water system, your system must be able to reliably provide an adequate quantity and quality of water at all times. One way to be sure you can do this is by keeping and using an operations and maintenance (O & M) manual.

Operations and maintenance manualWhat is the purpose of an O & M manual?

An O & M manual should be developed in order to ensure that your system is capable of supplying an adequate quantity and quality of water at all times. This manual should be set up so that all of the information necessary to operate and maintain your system is located in one place.

A three ring binder is recommended, since it allows updates of the manual easily.

What information should be included in the O & M manual?

There are several pieces of information that should be included in this manual. The manual should include sections on 1) system components; 2) a preventive maintenance schedule; 3) management or ownership; 4) financial arrangements; 5) water quality monitoring; and 6) emergency response plan and procedures.

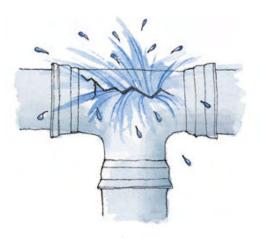
 The first section of the O & M Manual should be an inventory of system components. This inventory could include as-built drawings, distribution lines, pipe lengths, pipe diameters, materials, valves, blow-offs, pressure tanks and sizes, storage tank capacity, pumps, etc. Also include the age and condition of all of the system components and estimate their useful life and replacement dates. This is a good place to keep manufacturer's literature and warranties on your pumping equipment, pressure tanks, and other equipment. Keeping a copy of invoices in this section is also recommended.

- Along with an inventory of system components, a
 predetermined preventive maintenance schedule
 should be included in the manual. The purpose of this
 section is to help ensure that inspections, repairs,
 cleanings and other maintenance are performed
 regularly.
- 3. Another critical element of the manual is a section on the management of the system. This section should describe who owns and/or operates your system. It is also advisable to list an emergency contact with a 24hour phone number so that your customers, MassDEP, or the local board of health may contact you in an event that there are water service complaints, customer concerns, or an emergency.
- 4. A section should be about finances and your water system. Sufficient revenues should be available to meet or exceed the expenses it incurs. In order to monitor the revenues and expenses, you should develop and use an operating budget and that budget



should be included in the O & M manual. To assist in this, there is a financial viability workbook available from MassDEP. All systems operating in Massachusetts must be financially sound.

5. There should be a section in the O & M manual for water quality monitoring and testing. This section should include a copy of your sampling schedule and all water quality lab reports that were done for your system. If your water system requires monitoring for special treatment or disinfection, the sampling schedule should also include information about this additional testing.



6. A section of the O & M manual should identify how you are prepared to handle emergency events such as the failure of the power supply, treatment process, equipment, or structure. An emergency response plan and procedures will assist you and your employees in resolving problems. If you are able to resolve problems quickly when they arise, you will enhance the safety of the water that you provide. You will have less business interruptions or closures due to water quantity or quality concerns. You may also describe how you will safeguard your system's components and protect against vandalism. If you have a contracted operator(s) to run your system, their emergency contact number should be included in your O & M manual.

Operations and maintenance schedule Is there a recommended O & M schedule to help keep my water system in good working condition?

Well house		
Daily	Check overall function	
	Check sound of motors	
	Check system pressure	
	Read source meter	
	Check hydro pneumatic tanks	
	(charge with air as necessary)	
If Treatment:	Treatment chemical monitoring as	
	directed by MassDEP	
Monthly	Inspect well head (zone 1) and	
	sanitary protection area (zone 2)	
Weekly	Measure flow rate (weekly preferred,	
	no less than monthly)	
Yearly	Check pressure at flow rate	
	Measure water level in the well	

Storage tank		
Daily	Check tank level	
	Conduct site inspection and	
	security check	
Quarterly	Inspect vent, hatch, overflow, etc.	
Yearly	Test low water level alarms	
Every 3-5 Years	Reservoir cleaning	

Distribution system		
As Needed	Flushing	
	Repair leaks	
Monthly	Flush dead end mains if needed	
	Read and inspect service meters	
	Test run emergency generator	
Yearly	Exercise valves and fire hydrants	
	Yearly flushing	
	Determine % of unaccounted water	
	Perform meter maintenance	
	Service emergency generator	

Seasonal water systems

If my system is a seasonal water system, what are the important steps recommended for opening and shutting down my system?

You should follow the steps below when conducting start-up and shut-down procedures to help ensure you can provide safe and reliable drinking water to your customers.

Start-up procedures:

- ① A month before opening, thoroughly flush the drained system. By starting a month before opening, you will have time to correct any problems discovered before water is provided to your customers.
- ② Disinfect the entire system following approved procedures from MassDEP.
- 3 Collect coliform samples for analysis, marking the lab slip "other" for type of sample and specify "investigative sample" on the form.
- Make sure testing results are OK before water is provided to your customers.

Shut-down procedures:

- ① Close valve controlling water source to the facility.
- ② Open vents at the high points of the facility to be drained. These can be hose bibs, shower controls, lavatory faucets, etc.
- ③ Open the drain valves appropriate to the facility. There may be more than one.
- The Check to see that the entire system has drained completely.
- © Close drain valves and vent points. Do not leave the system valves and vents open while the system is shut down.

Cross connection control What is a cross connection?

A cross connection is an actual or potential connection between the distribution piping of a public water system and customer plumbing or on-site piping which may contain liquid or gas. Reversal of normal flow in the water system through a cross connection can allow



contaminants into drinking water either through back pressure or back siphonage. One example of a cross connection is a hose with one end attached to a water line and the other end lying in a sewer drain. Other potential cross connections can occur in automatic dishwashers, ice makers, commercial coffee urns, and post mix beverage dispensers using carbon dioxide (CO₂). These are all potential high health risk events. All water systems are required to develop a cross connection control program.

What is a cross connection control program?

A cross connection control program (CCCP) protects the health of the people drinking your water and the quality of the water in the system and is required of all public water systems. The complexity of a CCCP will vary depending on the size of your system and the potential risk. MassDEP must approve your CCCP.

MassDEP may request documentation that all high health hazard facilities - commercial, industrial, and municipal facilities have been surveyed by a CCCP surveyor as required by regulation and that backflow preventers are properly tested. Staff may request to see the record of inspection of certain facilities and testing results of backflow preventers.

A good place to keep your CCCP is with your O & M manual. Guidance and list of approved cross connection control surveyors and testers is available from MassDEP to assist you in developing your program.

Record keeping and reporting

What records do I need to keep and for how long?

As the owner of a water system you should keep the following records of operation and water quality analyses. A good way to maintain these records is a second three ring binder. Records need to be submitted if requested by MassDEP:

Type of Record	Length of Time
Copies of project reports, construction documents, drawings, inspection reports, and MassDEP correspondence (i.e., approval letter, operating permit, etc.)	Life of system
Chemical analysis, copies of any reports or communication relating to MassDEP inspections performed	10 years
Source meter readings	10 years
Records of daily operation, including chlorine residual, fluoride levels, iron and manganese levels, water treatment plant performance as applicable (i.e., types of chemicals used and quantity, amount of water treated, etc.), backflow prevention assembly testing, complaint log, incident reports, and any other useful records.	5 years
Bacteriological laboratory reports	5 years
Records of public notification for violations of primary drinking water standards	3 years
Consumer Confidence Report (CCR)	3 years



What do I need to report to MassDEP?

Unless you are instructed otherwise, the information that should be reported to MassDEP on a routine basis is:

- ① Annual Statistical Report (ASR)
 http://www.mass.gov/dep/water/approvals/dwsforms.htm#statrep
- ② all water quality analysis (even voluntary analysis) http://www.mass.gov/dep/water/approvals/dwsforms.htm#analyze
- ③ treatment plant reports http://www.mass.gov/dep/water/approvals/dwsforms.htm#reporting
- if you are a community water system an annual Consumer Confidence Report (CCR).
 http://www.mass.gov/dep/water/approvals/dwsforms.htm#ccr

The ASR is a MassDEP form that summarizes the important characteristics of each public water system and provides the current names, addresses, and telephone numbers of the system. Routinely check your ASR and inform your MassDEP regional office whenever any changes in name, phone number, connections, category, management, and/or ownership occur.

Continuity of service

What if I sell the water system?

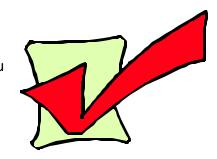
System owners need to be sure to inform MassDEP before transferring the system to a new owner. It is preferable that a one-year notice be given if possible. The individual transferring ownership needs to ensure that the new owner has received adequate training regarding operation of the utility, as well as ensuring that water quality and service are not compromised during the transfer. Customers must be informed of any ownership transfer. Contact your MassDEP regional office for system specific requirements for each transfer of ownership.



Water System Approval Process

System approval status How do I know if my water system has ever received MassDEP approval?

Your system is approved if you have a copy of the approval letter from your MassDEP regional office.



Approval process

What if my water system has never been approved?

If you propose to construct a new water system, a professional engineer (PE) licensed in the state of Massachusetts must complete the required documentation and submit it to your MassDEP regional office for written approval. Contact your regional office for guidance on the approval process for new water systems and requirements for a PE. You may also refer to the MassDEP guidelines and policies for PWS. You must make sure to complete the requested Water Supply Business Plan (http://www.mass.gov/dep/water/laws/policies.htm) promptly.

If you have an existing water system that has not received written approval from your MassDEP regional office, contact your MassDEP regional office for any specific requirements for the existing system.

Construction documentation

After I receive written approval to construct my water system, what must be done to get my new water system into operation?

Step 1. Upon approval, construct the



- water system according to approved construction plans and specification documents.
- Step 2. Have your system designer or PE inspect the system construction and certify that the construction is in compliance with the approved construction documents. Send as-built drawings to your MassDEP regional office. Your system designer or PE must confirm the completion of the system in accordance with department guidelines for a brand new system and provide evidence through a satisfactory water quality analysis.
- Step 3. Send a written report to your MassDEP regional office confirming the completion of the system in accordance with MassDEP approval plans and specifications.
- Step 4. MassDEP will conduct final inspection and provide written approval to begin service.
- Step 5. You will place system into service.



Terminology

Public water system

A public water system provides piped water for human consumption – the public. (Private and public in this circumstance refer to those who *use* the water and not who *owns* the system, i.e. public water systems can be privately owned or municipally owned.)

Human consumption

All drinking water should be suitable for human consumption. This applies to all water intended for human uses, including drinking, hand washing, food preparation, and cleaning of equipment used in the preparation of food or beverages. Process water that comes in contact with products intended for human consumption, and water included as part of a food



product must meet certain drinking water standards but is regulated by the Massachusetts Department of Public Health and the Massachusetts Department of Agriculture.

Water system classification

Determining which rules to follow

In order to determine which requirements are applicable for your system, you need to know if you are a community, nontransient noncommunity (NTNC), or a transient noncommunity (TNC) public water system.

Community Systems

You are a community system if you:

- You provide access to water for 25 or more residential people for 60 or more days within a calendar year, or;
- Possess 15 or more residential service connections.

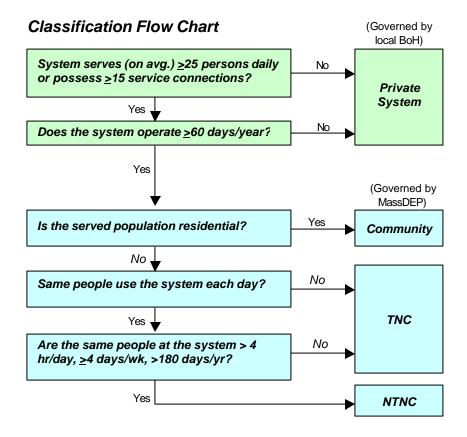
Noncommunity Systems

You're a nontransient noncommunity (NTNC) water system if:

 You provide access to water for 25 or more of the same nonresidential people for 180 or more days within a calendar year.

You're a transient non-community (TNC) water system if:

- You provide access to water for 25 or more different people each day for 60 or more days within a calendar year and do not primarily serve a residential community; or
- You provide access to water for 25 or more of the same people each day for 60 or more days, but less than 180 days within a calendar year.



Annual Certificate of Registration

What does the certificate of registration mean for my water system?

If you operate a public water system, you will receive an annual registration certificate that must be posted in a conspicuous area for your consumers to read. This certifies that your system is registered with the state and must comply with state drinking water regulations. Community and NTNC PWSs receive an 8.5" x11" certificate. TNC systems receive an 8.5" x 14" certificate that doubles as a water quality report.

If you can't locate your copy of your annual registration certificate contact the MassDEP Boston office for assistance.

MassDEP Regional Contacts

Who should I contact if I have questions?

The MassDEP regional offices are available to answer any questions regarding engineering design/approval and water quality monitoring requirements for water systems. Please contact the MassDEP regional office that serves your region:

Western Regional Office 413-784-1100

Statehouse West 4th Floor;

436 Dwight Street; Springfield, MA 01103

Central Regional Office 508-792-7650

627 Main Street; Worcester, MA 01608

Northeast Regional Office 978-694-3200

205-B Lowell Street; Wilmington, MA 01887

Southeast Regional Office 508-946-2700

20 Riverside Drive; Lakeville, MA 02347

For additional resources and links to other useful information, visit: http://www.mass.gov/dep/water/index.htm or email any questions and comments to the drinking water program director at: Program.Director-DWP@state.ma.us

Boston Office 1 Winter Street 6th Floor, Boston, MA 02108 617-292-5770

